

Technical information for private, trunked and public safety networks

AUGUST 2002

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Wild Fighters

Behind the lines of
Colorado's Hayman Fire with Megan Alderton

- APCO conference overview
- Denver PD Ricochet over mobile data
- Interoperability's strange bedfellows
- Why one chief turned off an 800 MHz system
- Public safety interoperability options
- Headsets and mics as firefighting tools

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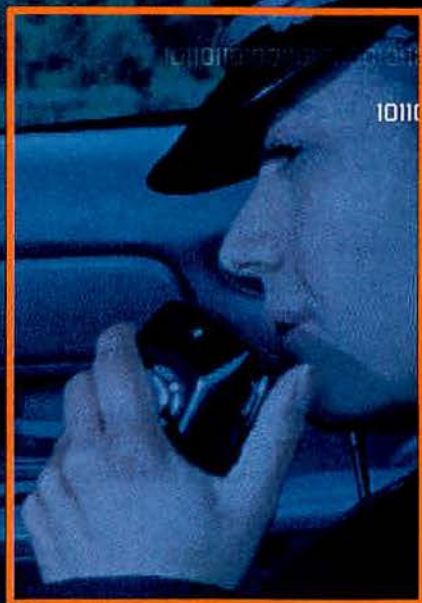


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AUGUST 2002
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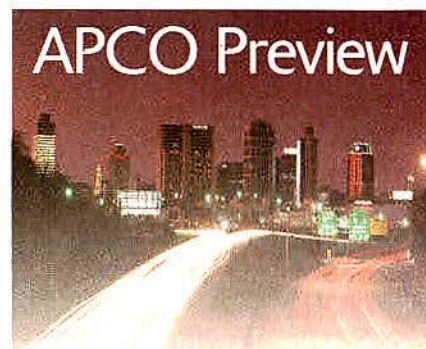
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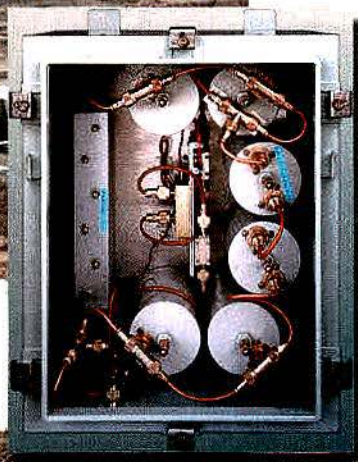
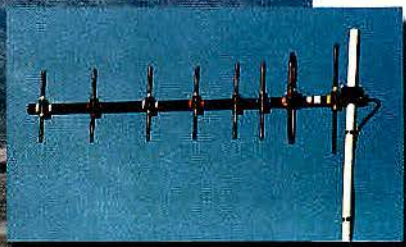
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Interoperability and the statewide network

It *seems* like a slam dunk.

Build a statewide 800 MHz digital radio communications system, and let city and county government agencies use it, too. Give the feds access. *Voila*. Instant interoperability.

From the rudimentary (various state highway patrol VHF low-band systems) to the magnificent (Florida, Michigan and Pennsylvania), states are in various stages of planning, building or operating statewide radio systems.

State police generally, but not always, lead statewide radio system projects. Many statewide radio system designs reflect their use by state troopers with relatively high-powered radios mounted in their vehicles, as opposed to relatively low-power hand-held portable radios often used by local police, fire departments and paramedics.

Take the Michigan system, for example. Based on the needs of the state police, the Michigan public safety communications system is primarily a mobile — not portable — radio system. The system uses 35 W radios permanently mounted in state police vehicles to achieve its maximum coverage performance. Agencies with portable coverage requirements may add infrastructure in their areas to use the statewide system and meet their communication needs—and that's a key statement.

Other radio systems are designed primarily for portable coverage, using lower-powered, 3 W, hand-held radios. These systems often have more towers or antenna locations to achieve maximum performance.

Still, other systems are designed primarily for paging, such as those used by many smaller fire departments.

In Indiana, a statewide radio system is under construction. As in Michigan, agencies with portable coverage requirements may add to the state's baseline infrastructure.

When agencies join the system and begin using portables, they can run into problems if the need for additional infrastructure isn't communicated, isn't understood or isn't acted upon.



Sometimes, a local agency might be lucky enough to be close to a statewide system tower. In that case, it might enjoy satisfactory portable coverage without its governing body having to spend money for additional infrastructure.

On page 20, the article "Turn It Off" describes why the police chief in Greenwood, Ind., disconnected his dispatch center from the Johnson County 800 MHz digital radio system that forms an initial piece of the Indiana Project SAFE-T statewide radio system. Please also read the article on www.mrtmag.com to see comments from a Motorola representative that could not be included in this issue because of its deadline.

Joe Pitcher, Johnson County's attorney and its communications project manager, said, "Motorola initially gave us a proposal to add a third tower at county expense, but we chose not to implement the site at that time."

Kourosh Bastani, system manager for Florida's law enforcement network, offered this advice in another place and time: "The police on the beat know exactly how they want to use their radios. Get

them involved from the very beginning." The same applies to other public safety end-users. Florida's law enforcement network requires mobile and limited portable outdoor coverage.

Officials in Grand Traverse County, Mich., are considering an \$8 million upgrade of the county's VHF highband system next year instead of joining the statewide system in part so local fire departments may continue using VHF pagers to alert part-time firefighters.

Oakland County won't be joining Michigan's statewide system. Officials there have opted to buy a separate \$32 million 800 MHz digital system designed for in-building coverage with portable radios. The proprietary system is incompatible with the state's network, although various levels of interoperability can be achieved in several ways aside from digital compatibility.

It may be disappointing to state officials when county and city governments choose not to join statewide systems. During the funding stage, many statewide systems are promoted to state legislatures as having good prospects for attracting participation on the local level that would save taxpayers money and improve service.

Statewide system planners should redouble their efforts to accommodate agencies with portable radio coverage requirements. After considering the alternatives, local governments should consider separate systems, if that's the best way to meet the in-building portable radio coverage and other specific requirements they may have.

Don Bishop

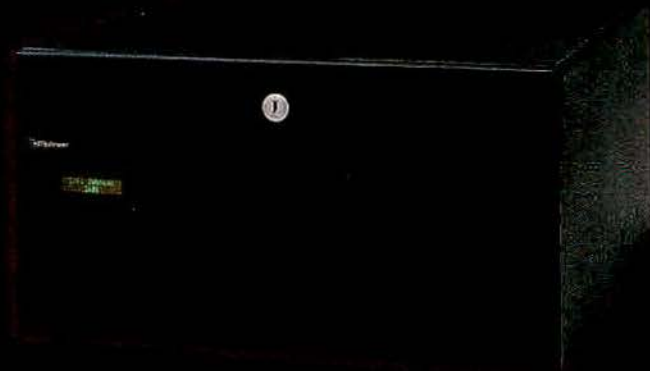
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CIRCLE (6) ON FAST FACT CARD

Adieu, but not goodbye

By Robert H. Schwaninger Jr.

Last night, I asked my wife's advice about being graceful, tactful and dignified. None of these traits is especially well bred within me. I have a tendency to choose candor over political correctness, hon-

Since I began writing this column some nine years ago, I am sure I have offended some people. Puffed-up corporate types, undereducated and overcompensated elected officials, and bureaucrats that can't

tell the difference between a good idea and a superior lobbying job, have all been fodder for my fanciful ravings. An ego is a fragile thing, and I have often ignored handling instructions for these too precious things.

My agenda was never hidden. I supported and continue to support the ability of local operators to thrive and survive in a political Dresden circa 1944. I don't like monopolies, even if they are more efficient. I don't like laws that favor the rich, just because they're rich. I think everyone deserves equal consideration under law. And I particularly don't like cowards.

The things I like are also known. I like good engineering that is affordable. Great ideas with ridiculous price tags are curiosities, not innovation. I like government officials

For example, I like the members of APCO, but I'm not crazy about an agenda that is based on the "everyone else be damned" theory of public safety superiority. I like most of the manufacturers, except when they grab the best deals for themselves and cut out their dealer network. I like Nextel's money. I just don't like Nextel.

As for auctions, I've never been a fan of selling something that doesn't exist. Selling frequencies is like selling temperature. Why don't we all just be honest and tell it like it is? The federal government is selling business licenses — period.

I could go on, as I have since 1993, but you have all read this before. Besides, I might offend someone or fracture another ego, and then what good would my talk with my wife have been? I've joked, pounded the table, railed, spit, screamed, cajoled, ridiculed and mainly poked fun at every pompous person, place and thing that our industry has produced over the last decade. It's time to hand the podium to someone else.

This will be my final column here in *MRT*, a home and haven for the madman that has, I hope, informed and amused tens of thousands of readers for nearly a decade. Although I will still contribute some work to the *MRT* Web site and will regale the faithful in another forum, I take my leave from these pages, cartoon and all.

To my faithful readers I say adieu and thank you for your patience in allowing me to entertain, stimulate and sometimes rile. To my detractors and those whose offense I have heartily earned, I say CHILL OUT!! It was always about having a little fun while trying to explore the topics of the day. It was never about you. ■

esty over politeness, and directness over tact. To some it's refreshing. To others, it is upsetting.

Schwaninger, *MRT's* regulatory consultant, is the principal in the law firm of Schwaninger & Associates, Washington, which is counsel to Small Business in Telecommunications. Schwaninger is also a fellow of the Radio Club of America. His email address is rschwaninger@sa-lawyers.net.

who are more concerned with the job they're doing and not the one they will do after they leave government. I like associations that care about all their members, not just the ones paying the highest dues. And I like corporations that want to make a profit, not just sell stock.

Then there are those mixed-bag things that keep me up at night.

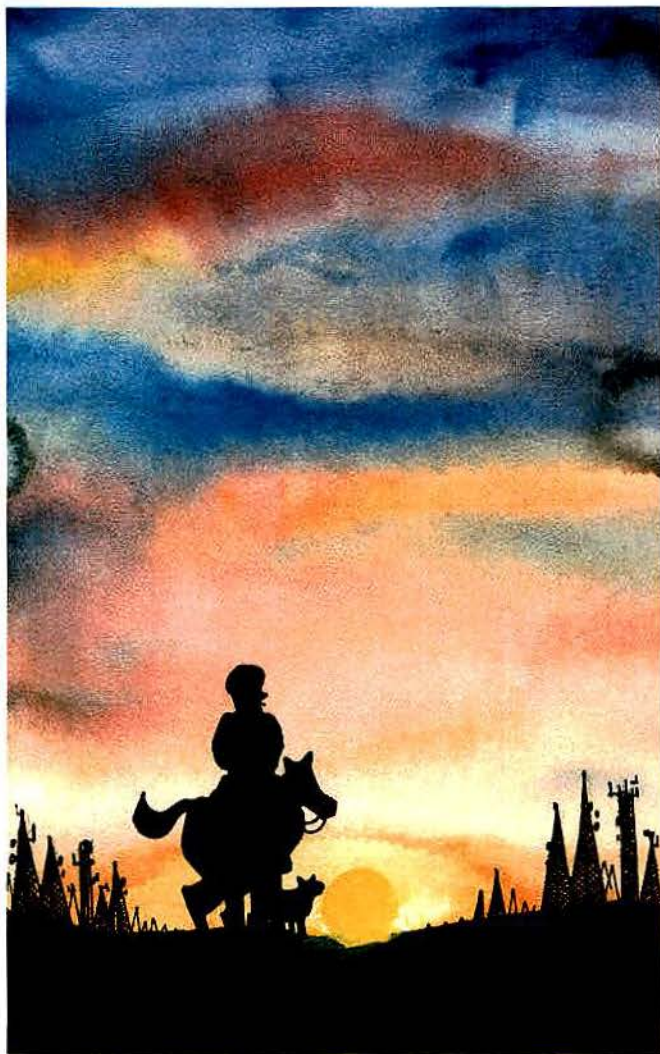


Illustration by John Hayes

The background of the advertisement is a collage of images. At the top left, a semi-truck is visible. In the center, a person wearing a hard hat and safety vest stands next to a vehicle. To the right, a radio tower is shown against a blue sky. The bottom half of the image is dominated by horizontal light trails from a fast-moving vehicle, creating a sense of speed and motion.

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20 years ago: An industry veteran looks back—again

Twenty years ago, Pat Weisner (MRT's co-owner and publisher at the time) asked me to write for the first issue of *Mobile Radio Technology*. He wanted a retrospective comparing 1982 equipment to previous two-way radio transceivers. I began work as an installer in my mid-teens, so by 1982, that gave me 20 years of experience. Pat titled the article, "An Industry Veteran Looks Back." If I was an industry veteran in 1982, what am I now with 40 years of experience, an industry has-been?

By then, semiconductors had replaced tubes for all but high-power applications, synthesized radios were emerging, and products were getting smaller. With today's surface-mount devices, microprocessors and RF technology advancements, radios are shrinking even more. Crystals, once widely used for discrete frequency selection, now mostly serve fixed oscillators and time bases. A 5W single-channel UHF radio that once would have weighed 50 pounds and filled the trunk of my car now fits in my pocket and has thousands of frequencies and functions.

Some companies of 20 and 40 years ago continue in one form or another, and others are long gone. The basic products have steadily come down in size and price. Marketing expertise has not replaced technical competence, but it is more important with increased competition and the need to sell five times the product for equivalent 1982 income in inflated dollars.

Mom-and-pop two-way shops have gone the way of the local TV repair store. Increased product reliability has reduced maintenance income, once a staple of their business. Where once were radio experimenters, now are entrepreneurs. "Mega-providers" of push-to-talk and telephone interconnect service (Nextel, cellular and PCS) have increased the competition. However, the increased demand for communications and associated wireless services also has greatly increased the market size.

I am still with the same company after 25 years, but my job is not the same as when I started the company. Successful people in our industry continue selling wireless solutions, but not the same ones. Frequencies that we thought had minimal value are now in daily use. Many users have embraced emerging markets, including wireless Internet access. Expertise in point-to-point communications has provided more opportunities in microwave. It's not your Dad's analog microwave, but new spread-spectrum and digital solutions.

Yes, Mr. or Ms. Two-Way Person, there is life after Nextel. You just need to go with the flow and apply your RF expertise to the next generation of products.

—Stan Reubenstein
Aurora Marketing Company
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CIRCLE (8) ON FAST FACT CARD

Don't let SIP become RIP

Stock up early and plan ahead.

By David O. Dunford

The Incident Command System is the master plan for responders — the set of established operating practices that enables the management of any scalable emergency incident.

One component of most emergency operating plans here in the midwestern tornado alley involves a seldom-mentioned practice called "shelter in place." Under a variety of circumstances, emergency man-

ter) in the best available nearby area of safety, refuge and/or comfort (in place.) The key words are "some time," which, in many plans, may be as many as 72 hours. With basic Kansas kounting, that's three full days during which disaster victims may not receive rescue assistance and/or have access to electricity, food, water or medical attention.

Even during a well-managed and highly localized disaster, emergency communications systems are heavily taxed. Remember that in addition to the "disaster"

In addition to regularly (not *routinely*) handling emergency situations, these people must field the occasional call for which an immediate emergency response is not available to the victim.

Certainly, then, no job task could be more difficult than talking directly with disaster victims for whom no foreseeable aid or response is available. Unless, perhaps, it's talking with victims and being required to explain "shelter in place." So what's a fellow to do?

As thoughtful and proactive emergency communications personnel, ostensibly we have provisioned our own system backbone (or our customer's facilities in the case of contract service providers) for an unanticipated and/or catastrophic operating cycle. Things look great in those one-line drawings, but the rub comes when we consider communications support service from the personnel perspective.

For just as with the public at large, communications technicians and managers may be unavailable because of SIP. Even if they wanted to come in, it's possible that they simply could not make their way to the job, which could leave the standard shift complement (if any at all) with minimal backup to handle operations.

Public safety systems are often configured with redundant facilities, anticipating a "standard" depth of dispatch and technical staff to help out under exceptional circumstances. An important criterion for operational unit planning should be the consideration of emergency operations that might occur without adequate dispatch or technical staff. Seventy-two hours would make a nice starting point for a brief but frank discussion of the communications system. ■

Emergency operating plans in the Midwest include the "shelter in place" protocol in which managers can count on disaster victims staying at their residence for some time after the onset of an emergency. This tornado hit the town of Cordell, Okla., in October. Photos courtesy of the Cordell Beacon.

agers "count on" disaster (or emergency incident) victims remaining at their business or residence for some time after the onset of the emergency. These victims would be instructed to hunker down (shel-

ter) in the best available nearby area of safety, refuge and/or comfort (in place.) The key words are "some time," which, in many plans, may be as many as 72 hours. With basic Kansas kounting, that's three full days during which disaster victims may not receive rescue assistance and/or have access to electricity, food, water or medical attention.

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Taming Hayman

On Sunday, June 9, Denver residents woke to the darkness of an ash eclipse. The largest wildfire in Colorado history burned on the horizon.

By Megan Alderton

Residents of communities just a few minutes' drive from Denver could see the fire's glow. The flames, which flourished under low humidity and drought conditions, would engulf 30,000 acres within 24 hours, destroying numerous structures and threatening hundreds of homes.

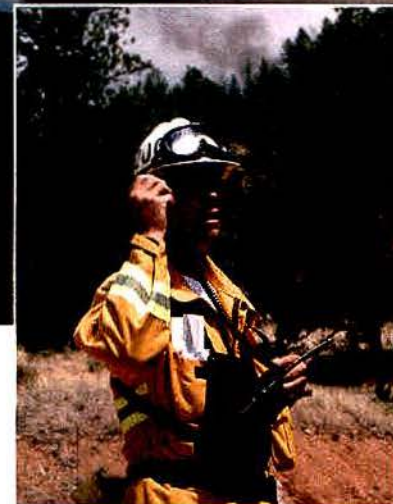
Hayman's rampage would continue for three weeks and, before it could be contained, the fire would turn 137,000 acres — roughly 155 times the size of New York City's Central Park — to ash. It would force thousands to flee. It would taunt fire crews and volunteers with a challenge few had

ever experienced. And it would prove the value of a viable communications backbone.

Commencing communications:

U.S. Forest Service worker Terry L. Barton, accused of having started the fire, reported it on June 8 at 4 p.m. The Pueblo Interagency Dispatch Center (PIDC) dispatched initial attack forces shortly thereafter. As the blaze burgeoned beyond its realm of control, the PIDC called in an overhead team from the National Interagency Fire Center in Boise, Idaho, to set up an incident command post.

When communications com-



menced on the fire's suppression efforts, a sequence of starter kits was ordered from the NIFC. A starter kit consists of UHF radios, VHF radios, a UHF repeater system, a VHF repeater system and link systems. Link systems are separate UHF systems that can be tied into the command VHF repeaters, allowing communications units

Alderton is associate editor. Her email address is malderton@primediabusiness.com. Photos by John Carr.



Smoke from the Hayman Fire rises over the foothills southwest of Denver. Above: Battalion Chief Jin Stephens of the South Placer (Calif.) Fire Department briefs firefighters on their work tasks at an early morning briefing near Deckers, Colo. Left: Pinole (Calif.) Fire Chief Jim Parrot directs a water dropping helicopter from a vantage point near Ox Yoke, Colo.

phones that can be used depending on locations and conditions. VHF is the primary frequency used for command frequencies and repeaters. UHF is the primary frequency used in the fire camps for security and connectivity between different sections such as facilities planning, situations and public affairs.

Cell phones are used mainly for logistics and supply. Because the Hayman Fire was not remote, a lot could be done over telephone lines and cell phones. However, cell phones are not used for tactical purposes.

"We may give a firefighter a UHF radio to connect with entities on the fire," said Stephen Jenkins, the chief of the NIFC's National Interagency Incident Communications Division, "but when he needs to call Goodyear for more tires, he can use a cell phone."

Logistically speaking

Fire commanders divided the Hayman Fire into 18 divisions. The south command, responsible for 13 divisions from Lake George to the Cheesman Reservoir, attacked the entire fire for the first three days; a second command was then established on the north end, which would be responsible for five divisions in Jefferson and Douglas Counties.

More than 21 agencies cooperated on the fire at one time; at its peak, Hayman had as many as 2,564 firefighters working to control it — a demanding environment for any communications network.

With so many agencies working together on any incident, standardization is paramount in leading successful communications. The wildland suppression group requires that radios be front-programmable or clonable so that units can actually change and alter frequencies as they need to based on geographic regions, Boulter said.

Most frequencies are partially licensed by the government for fire suppression and partially licensed by the government for other functions such as power administration

and military. As fire kits are built up out of Boise, temporary authorization is required for the use of different frequencies.

If a kit must be custom built to reduce cross-talk and interference from adjoining forests, a frequency coordinator in the geographic area must work with Boise to coordinate such an effort.

Communications under fire

Interference issues are common when crews are working in remote areas that include deep valleys and forests. Boulter's team encountered only minor, temporary problems generated by weather conditions and altitude due to a finite number of frequencies.

These issues are addressed by the frequency coordinator on site, who actively provides communications crews with guidelines for equipment placement. To resolve this issue, communications workers would daisy-chain a UHF remote to a UHF repeater with an omni antenna. This would hit multiple UHF receivers that would cross-link to VHF command radios and then broadcast to the line.

To address the issues of multi-agency interoperability, equipment was distributed to state and federal agencies out of the NIFC cache. The programmability of the NIFC radios allows communications between local sheriff and law-enforcement groups, local community groups and even private mining groups.

Future fires

Though communications apparently were well-supported and effective at the Hayman Fire, technology advancements can offer fighters of future blazes even better communications capabilities.

The NIFC is moving into the world of Project 25, Jenkins said, where only one vendor has met the contract and several are in the wings. However, from a national fire standpoint, he said, it might be a minimum of three years before the agency goes digital. The main concern is working with state and local cooperators. Issues such as cost,

to link multiple VHF systems together over long distances.

"The NIFC kits are very dynamic," said Communications Leader Jim Boulter, who traveled from Oregon to work with Hayman's sixth communications team. "They are designed to be implemented very rapidly in a demanding environment so that you can basically go from a stadium or a football field to a town of as many as 2,000 people in just a few days. Then you grow your system as you go to make sure it supports your needs, as a fire or incident would begin to travel outwards."

Communications units work on UHF, VHF and AM aircraft, as well as on cell phones and satellite

interoperability and backward-compatibility come into play. "It's OK for digital to talk to analog and for analog to talk to digital by throwing a switch on the digital unit," Jenkins said. "I want to see a smart radio that says 'I was called by this, and I respond that way.'"

Boulter agrees that P25 compliance will take time, but he believes that, because most government staffers are getting older, the challenge will not be the technology itself as much as finding people who can use and repair the equipment.

"What we'd really like to see in the long run are data communications across the lines where you could actually receive a compressed map or something like that in a division during a fire run," he said.

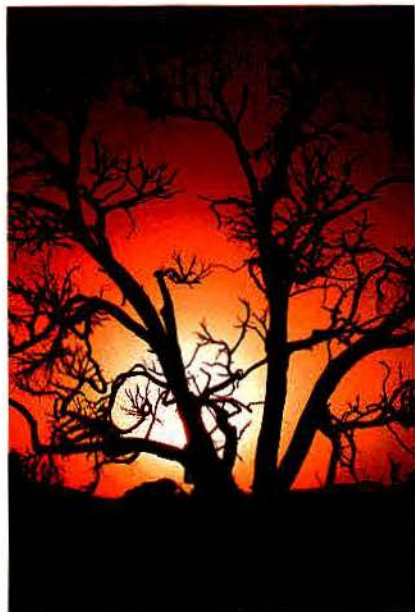
100% containment

After more than three weeks of non-stop efforts by fire crews and

volunteers, the Hayman Fire was reported 100% contained on July 1. Without successful communications, the blaze could have thrived for much longer.

"Being able to communicate can make the difference between successfully moving crews or suppression activity and saving lives and preventing injuries," Boulter said. "The communications as it was set up here at Hayman was done really well by the fire teams. Radio systems have made it so that not only can we function to effectively help prevent and suppress wildland fire, but they've also allowed us to be a little more accommodating to the personal needs of the people at the incident." ■

Amateur radio volunteers were also valuable contributors to communications at the Hayman Fire. Visit www.mrtmag.com to find out how their efforts helped in suppressing Colorado's largest wildfire.



Smoke from wildfires filters much of the harsh light from the sun. This photo was taken from a hilltop overlooking a Hayman Fire sunset. The tree had burned during the Schoonover Fire a month earlier.

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CIRCLE (11) ON FAST FACT CARD

Fight the NOISE

Headsets and speaker mics are a firefighter's second "hose."

By Don Bishop

At the Baton Rouge Fire Department, voice communication by radio begins at the microphone and ends at the speaker or earphone — same as anywhere else. That much is simple. Firefighting apparatus, such as pumpers and tankers, make loud noise that could induce

most daily to develop better ways of using microphones of all kinds and headsets," said Ed Smith, chief of the department's Special Services Division.

For comfort, hearing protection and an improved ability to hear from an earphone when noise is loud, a double-ear headset with gel-

or water-filled ear cups that mold to the ear work well, said Carolyn Servidio, president of RadioMate, a headset manufacturer in Concord, Calif.

But firefighters working the pumpers for the Baton Rouge, La., fire department prefer single-ear headsets.

"When our firefighters are standing next to the apparatus, they want the noise coming in, so they can be aware of what's going on. They won't wear double-ear headsets that reduce their peripheral hearing," Smith said.

Although a running pump makes a lot of noise, Smith said it is not so loud that the firefighters worry about

possible hearing loss when on an emergency response. He said that when operators might test a pump for 30 to 40 minutes at a time, though, they wear hearing protection.

Paul Mills, RadioMate's vice

president, said that OSHA requires a certain amount of noise reduction because of the siren. For example, the National Institute of Occupational Safety and Health puts a level of 85 dB as the dividing line between sound that doesn't cause hearing loss and sound that may. A worker near a siren could be exposed to sound as loud as 120 dB.

"The dual-ear headset protects hearing while allowing communications among users on the rig while it's running. It offers protection from loud and abrupt noises such as sirens and air horns," Mills said.

Servidio added that headsets supplied with a slotted ear cup for hearing protection allows the wearer to hear some ambient noise.

A second type of headset worn inside helmets serves firefighters working at a distance from the apparatus. With helmet headsets, Smith said the biggest problem is overcoming background noise in both directions.

"Clarity always is a problem. We try throat microphones and bone-conductive microphones. Most of our studies indicate that background noise is the biggest hindrance to the helmet microphone," Smith said.

The Baton Rouge Fire Department also wants headsets with interchangeability among helmets. The department uses a headset with a cloth strap that goes over the top of the head and drops down around the ear.



hearing loss besides interfering with communications.

"Communications is a vital part of firefighting. We experiment al-

Bishop is editorial director. His email address is dbishop@primediabusiness.com.

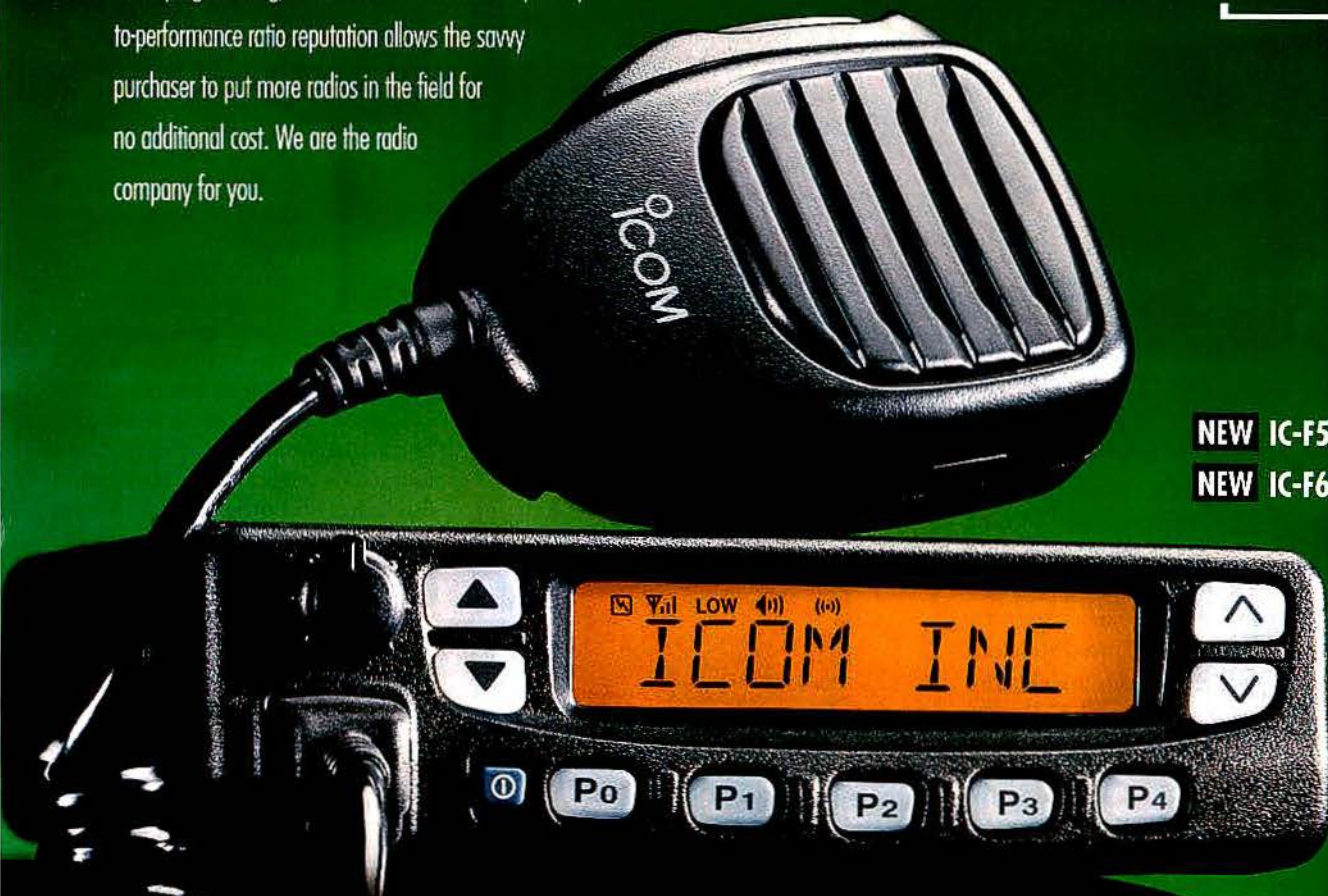
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With a headset inside the helmet, Smith said his department sometimes uses a pad-like switch positioned in the firefighter's armpit where it is activated either by pushing it with the opposite hand or by squeezing it with the arm.

"It helps with the background noise and avoids the risk of a speaker mic picking up everything that's said on the scene that doesn't need to reach the public through scanners. Things can get hectic, and people can shout some-

thing, and you have to control that function," he said.

Every truck has two portable radios with speaker mics. Firefighters normally carry them in a pocket made for the purpose. Smith said that the problem with those units was that "you have to have hands available to push the button to talk. And you're wearing an air pack and mask, everything sounds garbled, and you have to talk back through the mask."

Otto Communications in Carpentersville, Ill., designed its Genesis speaker mic with a large, snap-action push-



Genesis mic

to-talk switch that has positive tactile feedback, yet resists accidental actuation. The large diameter button allows a firefighter to actuate it with or without protective clothing such as fire gloves.

A dual grill seals the speaker mic from high-pressure water and submersion in 1 meter of water for 31 minutes (IP68 standard). A removable front grill and a washable speaker cavity area lets users wash away accumulated dust, dirt and other debris. An optional debris screen that fits beneath the front grill resists extreme conditions.

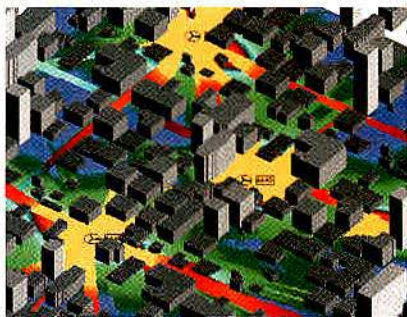
With an optional watertight accessory jack, the speaker mic supports skull microphones, throat microphones and headsets that can be used with a breathing apparatus.

Smith said that in firefighting, a hand-operated radio conflicts with the manual operation of hoses and axes. "There's a deficiency in having to use speaker mics, but we do use them," he said.

When it comes to radio communications, "the more information you can get out to the command post and to the firefighters, the more positive the results. That's always a goal we try to achieve," Smith said. ■

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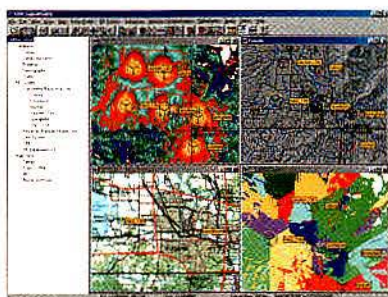
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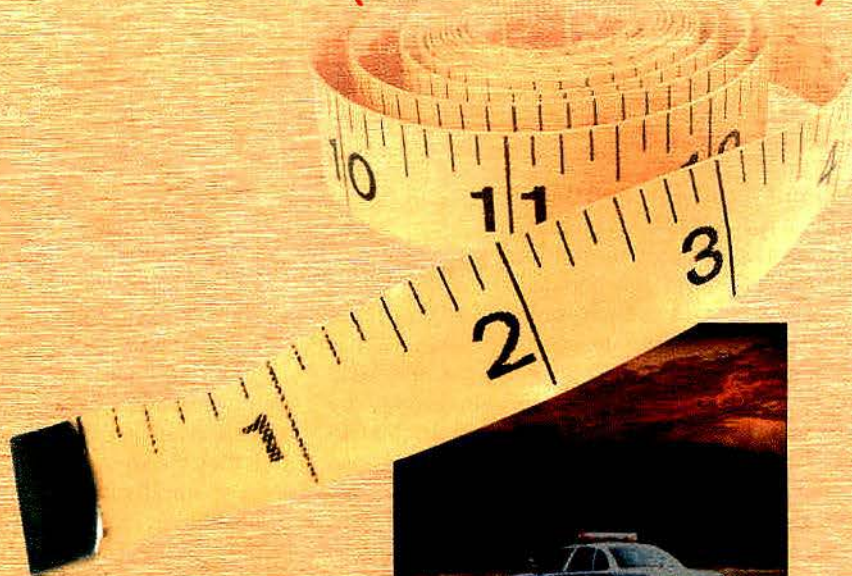
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CIRCLE (14) ON FAST FACT CARD

'Turn it off'

Police chief turns off 'showcase'
800-MHz system for lack of coverage

By Don Bishop

When Johnson County, Ind.'s new 800-MHz digital trunked radio system failed to reach the city of Greenwood's police officers at critical times such as vehicle pursuits and arrests in the face of resistance,

Greenwood Police Chief Albert Hessman concluded that the risk to his officers was unacceptable. He had his department disconnected from the 5-month-old digital system and reactivated the department's 10-year-old 150-MHz analog conventional system.

The closest digital system tower is 12 miles from Greenwood. Situated behind the police station, the analog system's short tower covers Greenwood but doesn't reach much farther.

"The county could have put a digital repeater on our tower and taken care of Greenwood. But its height wasn't sufficient to reach other agencies at this end of the county. The White River Township Fire Department, which also has problems with the digital system, can't be covered from our tower," Hessman said.

Hessman decided early on to keep his analog system as a backup. Switching over to it was rela-

tively easy. But the White River fire department had sold its previous radio equipment. Indianapolis came to the rescue, allowing White River to reprogram its 800-MHz digital radios to use the nearby capital city's 800-MHz analog repeaters until Johnson County's system could be made right.

Johnson County was the first among Indiana's 92 counties to implement a segment of a planned statewide public safety radio system; thus, the Johnson County system is something of a showcase.

"We were promised 95% coverage, 95% of the time with the equipment as installed. We never came remotely close to that. We were told that they had to change software, programming and volume adjustments. We were told that they had to fix this, repair that and tweak this, and this went on for months. In the next breath, they said the signal was not strong enough. Then they started using the reason that the way we're using the radios is not how they're not expected to be used," Hessman said.

Pointing fingers

"No one wanted to move off center. People said, 'It's your local board, it's their responsibility to fund a new tower. It's the state—Project Hoosier SAFE-T. It's Motorola's responsibility to make it work.' Everyone was pointing fingers at each other," Hessman said.

Once he disconnected the 800-MHz system, Hessman received a higher level of attention, including

a call from a state senator who had voted to fund the statewide system.

"I can only assume some phone calls were made and people were consulted and pressure was applied and they decided to make a good decision and fix it," Hessman said.

Les Miller, executive director of Indiana's Integrated Public Safety Commission, said that the commission understood and shared Hessman's concern that his officers have effective radio coverage.

Project Hoosier SAFE-T

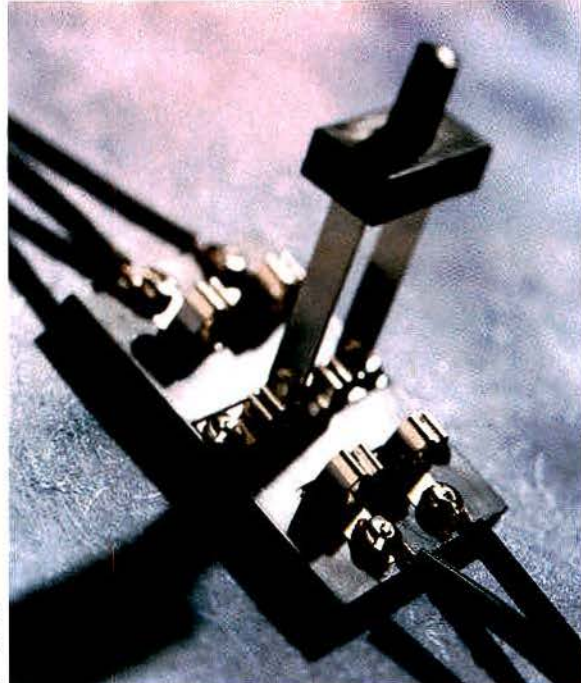
Miller said that Project Hoosier SAFE-T was designed to provide reliable radio communications for all public safety users in the state. He said that Johnson County was selected as one of the first areas in which to build the system to help the commission to address potential problems with the new technology.

Joe Pitcher, Johnson County's attorney and its communications project manager, said that county officials had expected some problems with the system, including some possible coverage problems in the northern area of the county.

"Motorola initially gave us a proposal to add a third tower at county expense, but we chose not to implement the site at that time," Pitcher said.

On July 11, Miller said that the current problems could be grouped into two categories:

"First, Motorola definitely had an issue with a specific hardware com-



For your own protection: Police Chief Albert Hessman shunned the new digital system.

Bishop is editorial director. His email address is dbishop@primediabusiness.com.



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SRM-12	10	12	3 1/2 x 19 x 9 1/2	4.7
SRM-18	15	18	3 1/2 x 19 x 9 1/2	5.0
SRM-25	20	25	3 1/2 x 19 x 9 1/2	6.5
SRM-30	25	30	3 1/2 x 19 x 9 1/2	7.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (Inches)	Wt.(lbs.)
SRM-25M	20	25	3 1/2 x 19 x 9 1/2	6.5
SRM-30M	25	30	3 1/2 x 19 x 9 1/2	7.0

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MODEL	CONT. (Amps)	ICS	SIZE (Inches)	Wt.(lbs.)
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SRM-30M-2	25	30	3 1/2 x 19 x 9 1/2	11.0

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CIRCLE (15) ON FAST FACT CARD

ponent in the system that they've fixed in the last two weeks. It's not clear to us how long this component had been failing, but we suspect that it may have been responsible for many of the perceived coverage problems. Those users still on the system indicate that they are satisfied with the fix," Miller said.

"Second, the SAFE-T system was designed to provide on-the-street coverage for mobile and portable radios, but would require enhancements by local agencies to provide in-building coverage. Compounding the problem, the Greenwood Police Department chose not to buy mobile radios and instead chose to operate their portable radios inside their vehicles, which reduces the portables' range. Although the county declined to pay for a third tower, we are working with the IPSC board to devise a solution to their problem," Miller said.

For his part, Pitcher said that he is confident that the problems in Greenwood can be addressed.

"While we certainly appreciate Chief Hessman's recent concern with the radio system, Johnson County has a committee that has been working closely with IPSC staff to address these issues all along. We have many users in the county that feel this system is light-years ahead of our old system, and we are committed to finding solutions for the challenges that remain," Pitcher said.

A decision was made to build a new tower closer to Greenwood. Motorola agreed to pay for the labor and installation. The state government will pay some of the equipment costs, and the county government will help with land acquisition.

"I still have some twinges of doubt whether this system will be what it is intended to be," Hessman

The lowdown on the system

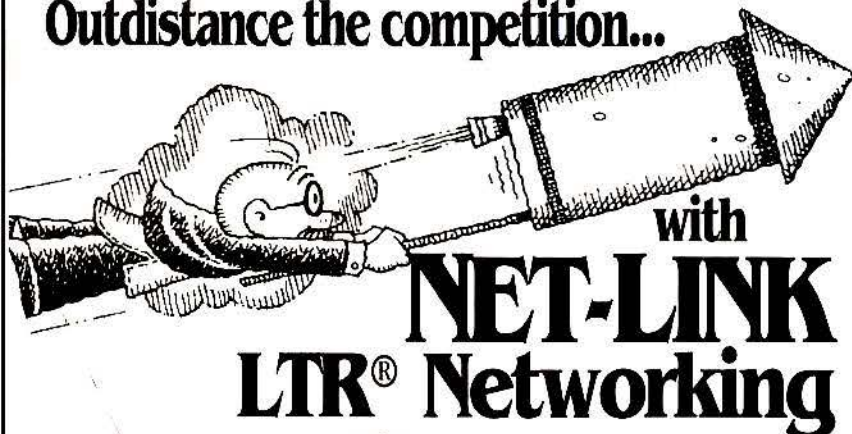
Johnson County's \$5.3 million 800-MHz system is part of Project Hoosier SAFE-T (Safety Acting for Everyone Together), which was launched in 1997 to develop a statewide voice and data system in Indiana.

The Motorola Astro SmartZone mixed-mode (analog and digital) system serves 900 users, including 12 fire departments and nine law enforcement agencies. The county purchased 165 Astro Spectra mobile radios for fire trucks, 680 XTS 3000 portable radios and 200 laptop mobile data computers. Dispatchers use 12 Motorola Centracom Gold Elite consoles.

said. "I don't know that public safety is ready for digital. Maybe not just yet. That's why I sit back a little and see how it develops." ■

Editor's note: A Motorola representative offered comments that could not be included because of this issue's deadline. The version of this story posted at www.mrtmag.com includes those comments.

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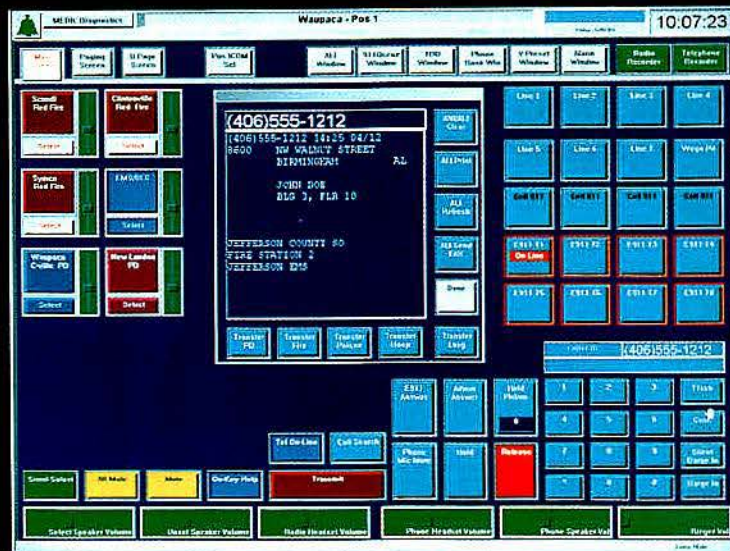
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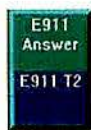
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CIRCLE (16) ON FAST FACT CARD

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CIRCLE (18) ON FAST FACT CARD

The day terrorists attacked the United States changed everyone in America. It also changed public safety communications' attention to preparation and its approach to potential, similar situations. This year's APCO International Conference & Exposition reflects those changes in its conference agenda as more sessions cover homeland security and terrorism. APCO also stays with some basics of mobile radio communications and the operations of 9-1-1 centers. Once again, the Association of Public-Safety Communications Officials-International brings the world of critical communications together on Aug. 11-15, 2002, in Nashville, Tenn.

APCO SuperSessions focus on events of Sept. 11

The Conference Committee, in cooperation with the APCO International staff, has designed a series of super sessions to deal with the historic and tragic events of Sept. 11, 2001. The sessions will enable the agencies involved to tell their stories directly to APCO members, according to APCO's conference agenda and registration information booklet. Expanded times and facilities have been arranged to allow representatives

from New York, Virginia and Pennsylvania to share the challenges faced and lessons learned. Also scheduled to appear is Jim Hall, former chairman of the National Transportation Safety Board, who will offer a unique insight into the critical issues that we all face.

An update of APCO's own homeland security initiatives will be provided.

John Sununu to chair APCO town hall meeting

John Sununu, former New Hampshire governor and White House chief of staff to former President George Bush will chair a "town hall meeting" at the opening session on Monday, Aug. 12.

The town hall meeting will continue APCO's engagement and dialogue on issues affecting public safety communications and homeland security and will follow APCO's Homeland Security Summit held in June in Washington.

As a follow-up to the summit, APCO said that it would be releasing a white paper at the conference. The white

paper "will be designed to provide clear direction to legislators and policy makers who are crafting new laws to improve America's homeland security."

A recently released APCO survey of public safety officials showed that 58 percent of public safety communicators consider funding to be the most significant barrier to meeting homeland security needs. APCO will present strategies in the white paper for local, state and federal jurisdictions responsible for public safety funding.

Additional public safety leaders will be added as participants of the town hall meeting.

Schedule at a glance

Sunday, Aug. 11

7:30 a.m.-4 p.m. Golf tournament
8 a.m.-5 p.m. AFC advisor refresher training
Noon-4 p.m. Exhibitor booth selection appointments
Noon-9 p.m. Registration
7 p.m.-11 p.m. Attendee welcome reception

Monday, Aug. 12

7 a.m.-7 p.m. Registration
8 a.m.-5 p.m. AFC advisor refresher training
8 a.m.-8:45 a.m. New attendee orientation
8 a.m.-3 p.m. Exhibitor booth selection appointments
9 a.m.-11 a.m. Opening general session/town hall meeting
12:30 p.m.-4:15 p.m. Concurrent sessions
5 p.m.-7 p.m. Exhibitor wine & cheese reception

Tuesday, Aug. 13

7 a.m.-5 p.m. Registration
8 a.m.-9:30 a.m. First general business session /awards
8 a.m.-5 p.m. AFC advisor refresher training
8 a.m.-5 p.m. Exhibitor booth selection appointments
9:30 a.m. Grand opening of exhibits

9:30 a.m.-1:30 p.m. Exclusive exhibit hours
1:30 p.m.-4:15 p.m. Concurrent sessions
6:30 p.m.-11:30 p.m. Grand Ole APCO Night

Wednesday, Aug. 14

7 a.m.-5 p.m. Registration
8 a.m.-5 p.m. AFC advisor refresher training
8 a.m.-1:30 p.m. Exhibits open
10 a.m.-11:45 a.m. Concurrent sessions
Noon-2 p.m. Past presidents/life members luncheon
Noon-2 p.m. Chapter presidents/secretaries luncheon
1:45 p.m.-3:15 p.m. APCO SuperSession

Thursday, Aug. 15

7 a.m.-10 a.m. Registration
8 a.m.-5 p.m. AFC advisor refresher training
8 a.m.-9:45 a.m. Concurrent sessions
8:30 a.m.-4 p.m. Corporate advisory committee meeting
10 a.m.-11:30 a.m. APCO SuperSession
1 p.m.-1:45 p.m. Concurrent sessions
2 p.m.-3:30 p.m. APCO SuperSession
6:30 p.m.-7:30 p.m. Closing reception
7:30 p.m.-9:30 p.m. Closing banquet

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CIRCLE (19) ON FAST FACT CARD

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The interoperability quandary

Don't get rid of that radio system just yet. You may have other options.

By Jay Herther

A category 5 hurricane slams into the South Carolina coast, flooding coastal roadways, destroying houses and knocking down powerlines. A freight train carrying hazardous materials de-rails in Nebraska, forcing the evacuation of thousands of people and requiring the assistance of federal authorities to de-

nation of multiple first-response agencies that ensures successful management of the public's safety.

However, many existing radio systems do not allow individual agencies to communicate with one another. As a result, legislators, federal agencies and organizations such as the Public Safety Wireless Network and the Association of Public-

A more viable approach is to achieve large-scale interoperability via a network-based solution, using similar principles as communications networks used by Internet providers and voice carriers.

Such a network would connect existing systems into regional, statewide or national systems to create a private Intranet for multi-agency interoperability without requiring the purchase of new end-user equipment.

With significantly less infrastructure investment, easy compatibility with disparate systems, quick time to implementation and flexibility for future upgrades, this network approach offers the best option.

[Some agencies are opting to use "patches," an effective, yet old-fashioned way of achieving interoperability. See sidebars.]

Network-based interoperability works with Internet protocol-based technology or packet switching. Traditional voice networks (telephony or land mobile radio) are *circuit-switched*. In circuit switching, users share an exclusive connection (a circuit or radio channel) for the duration of the conversation. With circuit-switched technology, one call ties up the dedicated circuit.

In *packet switching*, information is divided into packets, discrete units of data with address labels that direct them to their final destinations (the end-user devices). Multiple users share access to a circuit or radio channel by taking turns placing their packets on the channel. Every end-user device on the network has an IP address, and calls are routed to their destinations — groups, individuals or data

Union, justice, confidence

Louisiana's state motto is well reflected in Chief Duane D. Johnson's attitude toward interoperability and New Orleans' preparation for homeland security.

The assistant superintendent and deputy chief (who is chief of operations) at the New Orleans Police Department said that "the ability to communicate is critical to response." And public safety agencies in his state seem to be able to communicate.

New Orleans' location presents special challenges to interoperability with its proximity to the Gulf, intracoastal canal and Mississippi River. "The challenge there is the Coast Guard and the water response units, and Harbor Police," Johnson said.

Port security is crucial. "Potential targets, which include chemical plants and key waterways, have increased awareness of why public safety agencies need to communicate through radio," Johnson said.

New Orleans already has estab-

lished a level of interoperability with the state through "a patch on two frequencies. They have Motorola Astro and we have EDACS, and people have been told the two can't operate," Johnson said. "We established console patches with radios and then went hard patch with phone lines."

Johnson encouraged agencies to try to establish "hard line patches" on a regular basis or a console patch with radio in each agency, so when they need to move to an operations channel, they can.

"We think that will be the case with the Coast Guard. The state police has state-of-the-art, but each local agency has its own. With the Coast Guard operating from Baton Rouge along the shipping corridor and Gulf of Mexico, the advantage of having the state police linked to maritime and the private sector for oil spills—and having a connection through our patch—will prove effective." —NC, DB

contaminate and re-construct the accident scene.

It's not a question of *if* the next large-scale crisis will occur but *when*. In such situations, it is the coordi-

single radio-based system, requiring state and local governments to replace all radio equipment and infrastructure with new standards-based equipment. Due to the tremendous costs, time and frequency requirements involved, this approach is not feasible.

Herther is director of product integration at M/A-Com Wireless Systems.

terminals — by a combination of network hardware and software.

The principal requirements of critical communications networks can be met with a private Intranet tailored for public safety use. The private Intranet can be designed to provide the fast response times, excess network capacity, talkgroup configuration, high-quality voice and security, and interoperability that are essential to public safety.

A major reason large-scale

interoperability solutions do not already exist is cost. It would be expensive to purchase entirely new infrastructure and end-user equipment required for a radio-based system.

However, with an IP-based solution, it isn't necessary to invest in new equipment because it is "technology neutral." This concept is best understood in the context of today's public Internet. Regardless of the type of end-user device — a PC, PalmPilot or iMac — each can connect to the Internet.

Network flexibility

With IP-based interoperability, existing radios can access the network and communicate *via* IP. The flexibility of the network infrastructure allows communications to appear seamless to the end-users.

As a result, there is no need to dedicate resources to training first responders on new radios. Radio system upgrades can be made as departments desire or require over time and as budgets allow.

Even if it were possible to equip everyone with the same radio, build out new infrastructure and complete all necessary training, radio-based systems still possess drawbacks. Available radio frequencies

for public safety are a scarce commodity, with just over 10 frequency bands existing today. Because it would be impossible to design a large-scale system where all new radios fit within the same frequency band, a true interoperability solution must have the ability to cross-band, allowing VHF radios to talk to 800-MHz radios. Because it's network-based and not reliant on frequency availability, an IP-based solution accomplishes cross-banding among disparate radios.

Radio standards age quickly. The latest and greatest comes out every few years, rendering once "state of the art" equipment obsolete. Will upgrades be compatible with existing radios, or will every agency have to upgrade to remain interoperable (starting the whole process over again)?

With an IP-based solution, there is no fear of future technologies. Because an IP-based solution is technology-neutral, equipment developed in the foreseeable future will still be compatible with the network.

If local and state public safety departments can network first, they will have found a way to enhance their communications system and, most importantly, improve their ability to protect the public. ■

Patches and mutual aid

Ozaukee County handles interoperability through a single radio system, mutual aid channels, radio patches—and meetings.

"Interoperability has a broad definition," said Duane Willborn, radio and telephone systems manager for the county in Wisconsin. "We have a users' group within the county ... we meet probably every three months. We talk high-speed chase policies, emergency operations as far as what happens with hazmat stuff. We discuss holding traffic to a minimum when there is a multi-agency emergency."

The county also uses a M/A-Com EDACS system that it bought in 1991 for \$4.5 million.

"When we moved to EDACS, it was a huge political issue because of the money. We had two police departments with brand new conventional systems," Willborn said. "With Sept. 11, they said 'enough of this. Our equipment has aged. EDACS is here and proven; it's time to move.'"

Willborn said that over time, those departments discontinued installing 800 MHz and didn't have enough units to move over to EDACS. "They wanted the rest of the county to hear them, but most of us had removed our conventional equipment."

So the county set up a "hard patch" with an audio delay because "when you're going from conventional to trunked, there's a key-up delay."

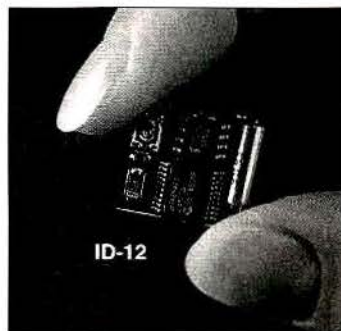
Communications was tested when a 50-car pileup occurred a few years ago, and "we had six cars spread along the five-mile pileup talking back and forth continuously."

Other counties have 800-MHz systems, but not the same manufacturer or service provider. Willborn said that Ozaukee can communicate via mutual-aid frequencies. "Those work on our radios, and so that presents little problem."

—NC, DB

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Faster than a speeding bullet

The prospect of affordable, high-speed mobile data excites Denver's police department.

By Don Bishop

The prospect of affordable high-speed Internet and virtual private network access that extends wired desktop computer capability to laptop computers in patrol cars has the Denver Police Department eagerly awaiting the launch of a Ricochet net-

work that the department has been testing in limited areas of the city since February.

"It's amazing what you can get with the speed. I've been used to a CDPD modem. Once you get one of these, it's like going from dial-up to broadband," said Lt. John Pettinger, commander of the department's Computer Help and Information Planning Bureau.

Ricochet uses a dense network of short-range radios mounted mostly on lamp posts to support typical data rates of 175 kbps, with bursts to 400 kbps.

"With CDPD's 9600-baud rate, we can't send graphics, only small text items. With Ricochet, we receive emails with attachments. We send a lot of photos and digital camera pictures back and forth," Pettinger said.

With high-speed data, officers in the field can access mug shots of arrests to confirm identities, a capability that Pettinger said the department had lacked. Photos previously sent to district stations for officer retrieval could be sent directly to patrol cars, possibly speeding the recovery of missing children, for example.

Pettinger said that pushing graphics to patrol cars is a huge step forward. The po-

lice department's geographic information system brings up photos and maps of neighborhoods that could help with pursuits, searches and investigations.

"On GIS, you can see sidewalks, houses, sheds and other smaller structures, and an incredible amount of detail that we didn't have before," Pettinger said.

The network's capability pleases Pettinger for another reason that involves keeping the department's computers operational around the clock. Previously, an after-hours call would incur more overtime pay for network and system administrators because they had to drive to police headquarters or return home to a desktop computer.

"Now I give them a laptop computer and Ricochet. They don't have to be tied to a computer at home or at headquarters. They fire up the laptop, log into the administrative interface with their access rights, and see about handling the problem remotely. I don't pay as much overtime to resolve problems. And we're getting network up a lot quicker than before Ricochet. We resolve 95 percent of the computer network problems via the wireless connection. From the perspective of network administration, that's a huge benefit," Pettinger said.

Once Denver's city government gives Ricochet the go-ahead to use



Examples of wireless modem deployment include laptop computers for officers in patrol cars and personal data assistants for officers on motorcycles and bicycles. The tiny modems (circled) aren't visible, but the antenna whips connect to the modem PC cards inserted into the computer and PDA.

Bishop is editorial director. His email address is dbishop@primediabusiness.com.



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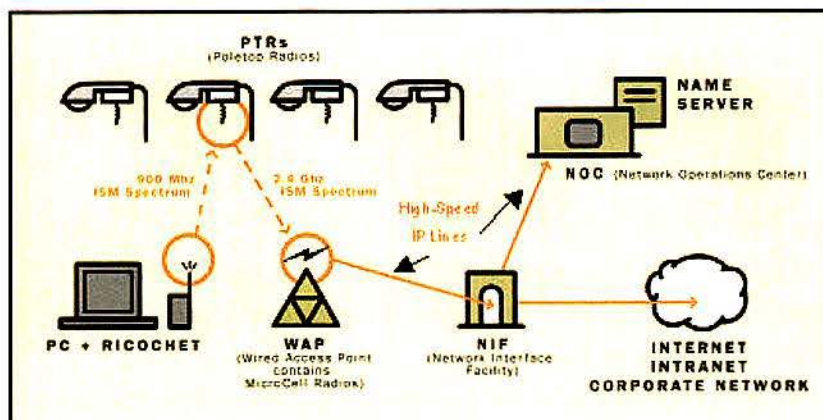
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Time to market	Available	Available	2001-2002	Limited 2002	Available	Available	Available	Available
Theoretical peak speed	to 19.2 kbps	144 kbps	115 kbps	144 kbps	796 kbps	1.5 mbps	7 mbps	11 mbps
Avg. data rate per user	8-9 kbps	35 kbps	40 kbps	56 kbps	176 kbps	256 kbps	1 mbps	256 kbps to 1 mbps
Billing type	Usage	Usage	Usage	Usage	Unlimited	Unlimited	Unlimited	Unlimited/usage
Network type	Wireless data	Wireless voice/data	Wireless voice/data	Wireless voice/data	Wireless voice/data	Wireline data	Cable	Indoor wireless data
Ease of installation	Easy	Easy	Easy	Easy	Easy	Difficult	Difficult	Easy
Cost for 180 mbps (avg. Ricochet user)	not possible	~\$540	<\$720	~\$540	\$44.95	\$40-50	\$40-50	\$60-75
Current operators	Verizon, Sprint PCS	Sprint PCS	Voicestream, Cingular	Verizon	Ricochet	Various	Various	Various

A table prepared by Ricochet Networks compares its service to other mobile data technologies.

its pole-top radios for commercial customers, the network can be fully activated and service can be offered to the police department throughout the city. The city may give activation approval first, and then sort out the financial arrangements — whether to barter the pole-top rent for network service and products or exchange cash.

Pettinger sees value. "We're spending a lot of money on CDPD cards. The last one I bought was \$299. And we're paying \$40 per month for unlimited access for CDPD. Between CDPD and Ricochet, the value is

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The CPI line of Multi-Channel remotes includes systems for the Kenwood -80 and -90 series as well as Motorola's CDM1550(LS) and M1225 Series. CPI's new TTP216 tone termination panel is now available and the TR810 console and TR Multi-freq remotes will be available in the next several months.

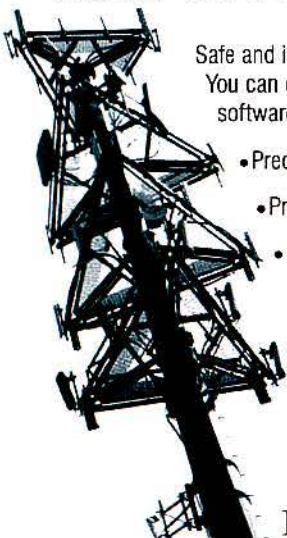
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CIRCLE (24) ON FAST FACT CARD

Ricochet's roots

Denver-based Ricochet Networks has roots in defunct Metricom, founded in San Jose, Calif., in 1985. KN Energy (now part of Kinder Morgan, Houston), a 10-state natural gas services company, once was home to several Ricochet Networks executives. KN Energy had been a Metricom reseller.

KN also incubated Aerie Communications, a planned, yet never built, national fiber-optic network on 12 gas companies' rights-of-way. In 1999, and renamed "Aerie Networks," the enterprise bought out its gas company investors under leadership by former KN executives with venture capital backing.

Metricom spent \$1 billion to develop and partially deploy a wireless network using lamp post-mounted ("pole-top") radios on unlicensed 902-MHz and 2.4-GHz frequencies. The network first was built to read electric power and natural gas meters. Later reconfigured with a speed boost from 28 kbps to 128 kbps and higher, Ricochet offered Internet access to consumers.

With only 51,000 customers in 14 activated markets, Metricom collapsed in July 2001. Omar Javaid, chief technology officer at Mobilicity, a New York technology services company, said that at \$350 for modems and \$75 for monthly service, the price was too high. And he said that Metricom should have pursued public safety and health care customers instead of consumers.

On Nov. 2, 2001, a bankruptcy court awarded 500 trailer-loads of network equipment to Ricochet Networks for \$8.25 million. The court gave 16,000 installed pole-top base stations to lessors, mostly municipalities. Ricochet Networks prefers to exchange lamp post rent initially for free service—the method previously used by KN as a reseller.

Mort Aaronson, former president of KN's non-regulated subsidiaries and now president of Ricochet Networks and its collocated parent, Aerie Networks, first wants to restart the Ricochet network in the 21 markets where Metricom had built it.

much better for Ricochet, and the performance is 10 times better. It's frustrating to be on CDPD after you've been on Ricochet for a while," he said.

The Denver Police Department has laptop computers in 400 vehicles, and Pettinger said that with the right deal for services, using Ricochet could offer a huge cost savings together with a large increase in mobile data capability. ■

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Interoperability makes strange bedfellows

Denver police use 600 Nextel phones for interoperability.

By Don Bishop

A pilot program for mobile communications interoperability at the Denver Police Department includes 600 Nextel phones.

Why strange bedfellows?

Denver's 800-MHz EDACS analog police radio communications system currently receives some interference from Nextel cell sites. And if Nextel were to have its way, Denver and many other 800-MHz system users would have to change

frequencies in a national migration estimated to cost billions of dollars. That said, let's set aside Nextel's and Denver's interference problems and focus on their interoperability project.

"We're testing Nextel phones for interoperability and as a back-up for our own radio system," said Lt. Roger

Barker of the department's ID Records Bureau. "Our cars presently have cell phones, but they're not a radio-phone, so they can only make phone calls."

Interoperability — On the police radio system, Denver officers can make direct radio contact with their counterparts in nearby cities, but the process is difficult and con-

voluted, Barker said. The Nextel phones give Denver officers the ability to talk easily and directly with many drug enforcement and gang intervention teams in neighboring jurisdictions that already use the wireless carrier's phones. The need sometimes arises when events take police or suspects near or across jurisdictional boundaries.

Back-up — The Nextel phones would give the department a means of wireless communica-

tions if its own radio system were to fail altogether.

Graham Bennett, Nextel's area vice president, said that additional phones were deployed to the Denver Fire Department and to officials of the Denver Health and Hospital Authority's Paramedic Division that provides the city's 9-1-1 emergency medical services.

"This additional deployment supports communications interoperability among police, fire and

The Nextel phones would give the department a means of wireless communications if its own radio system were to fail altogether.

Downtown with Nextel

Before the pilot project to equip Denver Police Department patrol divisions with 600 Nextel phones, the department's District Six and its Downtown Motorcycle Unit deployed 30 Nextel phones.

The phones are used to improve communications among the police and downtown businesses. A key participant is the Downtown Denver Business Improvement District, funded by downtown property owners through the non-profit Downtown Denver Partnership.

The "Cellular Phone Talk Group" on the Nextel phones allows anyone in the group to use the two-way radio function to broadcast information to all other members for the purpose of crime prevention, suspect apprehension, critical incident management and partnership-building. The police department controls membership in the talk group and sets the policy for its use.

Don Pesek, BID's operations manager, said that the Cellular Phone Talk Group appealed to his organization

after Sept. 11, 2001, because BID received calls from property owners asking about security. He said that each building was making up its own rules, and BID thought the talk group would offer a means of discussing downtown problems, not to mention its usefulness in controlling shoplifting.

"It puts more eyes on the street. That's what we strive for, having everyone looking out for each other," Pesek said.

Officer Mylous Yearling from the motorcycle unit said that the police had found that a separate radio system for the same purpose would cost three to four times as much as the least expensive alternative. Plus, many of the businesses already had Nextel phones.

He also said that a civilian on a phone guiding the police to a possible suspect doesn't attract as much attention. The civilian feels more comfortable using the phone, and the subject isn't as likely to react to seeing someone using a phone compared to a radio.

Bishop is editorial director. His email address is dbishop@primediabusiness.com.

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CIRCLE (26) ON FAST FACT CARD

emergency medical services," Bennett said.

A fire department spokesman said that 50 Nextel phones are being tested as a back-up to the radio communications system and are not being tested for interoperability. A

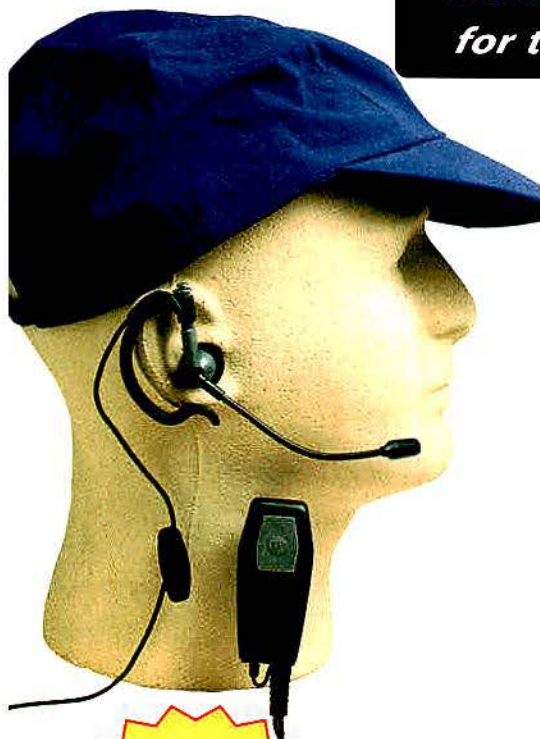
paramedic department spokesman said that his department is testing 10 phones for interoperability and back-up capabilities.

The phones are configured using all of their features, including "direct connect," which is Nextel's

name for push-to-talk radio communications. For the police department, Barker put together a matrix of talk groups in 35 areas within the city, and Nextel programmed the phones.

Following training sessions, the phones were deployed between June 24 and July 10.

Audio Products for two-way radios

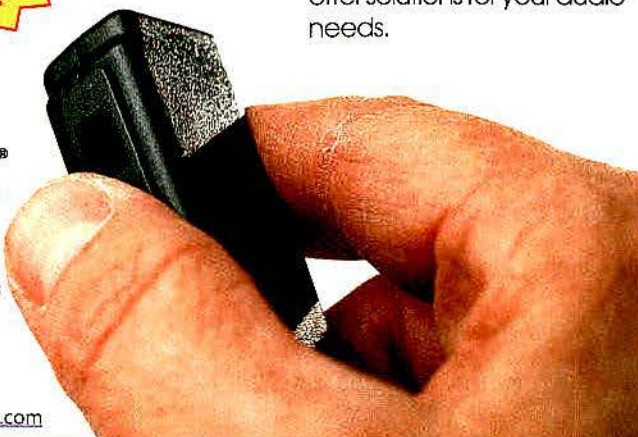


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Dispatchers' involvement

How to involve dispatchers is yet to be resolved. Barker said that, one way or another, dispatchers will have the capability of contacting officers with the Nextel phones.

Most of the phones have been placed in patrol divisions, and others with workers in the crime lab, and still others with assault and homicide detectives who are most likely to be in contact with the gang intervention and SWAT teams. Any additional deployment is yet to be determined.

Barker said that he has had excellent feedback about the phones. When it comes to a choice of using the phone or the police radio, he said the radio still is primary.

"But if an officer needs to talk with someone individually about a crime or a suspect and it's something no one else needs to hear, using the Nextel frees up the airwaves," Barker said.

As far as interference goes, Barker said that the Denver Police Department's relationship with Nextel about that problem has been better than what he has heard it may be for other departments in other places.

"I'm not sure why that is. From what I've heard, they've been more than willing to work with us here. They've made some progress on the interference problems. Not by any stretch of the imagination is the work done or the problem resolved, but Nextel has been responsive. We've had a good relationship," Barker said.

"Plus, we're surrounded by agencies in adjacent cities that use Nextel units."

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Vendor locking

A former vendor locker prefers the view from the other side of the fence.

By Larry Kovarik

I worked 11 years for a dealer who stressed that if his manufacturer's unique trunking protocol were sold, it would essentially lock out other vendors from future purchases. What a great marketing idea, right?

Sell a unique protocol upfront (but don't tell the customer) and throw future equipment purchase discounts out the window. At first I agreed because like most young hungry salespeople, I could equate that into more money in my bank account.

But wait a minute, whose best interest was I thinking of, myself or the customer? Was that my conscience talking to me?

Some . . . customers are just now figuring out that they are locked into their current and only vendor as they seek out competitive bids.

Since when did my conscience interfere with my sales philosophy? Well, since about three years ago when my own city installed a state-of-the-art unique digital trunking system.

Here in the Midwest, public safety departments are slowly upgrading old VHF repeaters to modern trunked radio systems to maximize frequency spectrum and system flexibility. Unique protocol systems have been popping up in city and countywide applications over the past few years.

Some of these customers are just now figuring out that they are locked into their current and only vendor as they seek out competitive bids. Some public officials are starting to ask, "Why did we purchase a

unique radio system anyway?"

I guess if you are the dealer who sold one of these unique protocol systems, then you would say vendor locking is good, but if you are a tax-paying citizen or a smart business owner you might strongly disagree.

Turnabout

In my case, the manufacturer sold the digital trunking system direct and contracted the (other) local manufacturer dealer in our city to maintain the system. The ironic thing is that the philosophy being taught within my own company was being used by our own equipment manufacturer—against us. This unique system equipment could only be sold directly by the manufacturer, in essence cutting their own dealers' throats.

Not only was this one of the most expensive infrastructure bids, it also cost my city \$2,300 per every hand-held and more than \$3,000 per every mobile unit sold.

I'm sorry, but no \$2,300 or \$3,000 unit is going to save my life any better than any top-of-the-line radio from any other manufacturer on a common protocol selling for one-third to half the price. Any properly designed system with quality radios and encryption can perform to the same level and equally provide security to this unique protocol system. What a waste of tax dollars.

What's even worse is that entire counties are going with unique ESMR 800 MHz where equipment costs are between \$2,000 and \$3,500, and then they are being charged a monthly fee of upwards of \$30 per radio for monthly service. It appears the big selling point

of this particular system is that they can communicate with other radios outside of their county on a statewide system.

From talking with people within these communities, my guess would be that less than 5 to 10 percent would actually use this feature on a consistent basis. Most of these people already had cell phones that could be used instead.

Now, does it make sense as a public department to invest in a system that charges for monthly services that 90 to 95 percent will not use?

Both examples still have entities within the city and counties that need to maintain the old VHF equipment and system to communicate with surrounding counties in addition to the 800 MHz radios. In the county ESMR 800 MHz example, smaller volunteer fire departments have a difficult time purchasing actual firefighting apparatus, let alone multiple \$3,000 radios.

Business decision

How does it make any sense to commit to one vendor as a government entity when you have no possible back-up and equipment costs are monopolized as long as that system is in place? Would that be a good decision for any business?

Vendor locking is bad. I see absolutely no realistic (worth spending the taxpayer's money) advantages. I am happy to say I work for a company who believes in taking care of the customer's best interest, not ours. I have been on both sides of the (dealer's) fence and prefer the view from this side. What side of the fence are you on? ■

Kovarik is sales manager at Graybill Electronics, Hiawatha, Iowa.



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Private wireless attempts to work with Nextel

The Private Wireless Coalition has been meeting with Nextel and public safety groups in an effort to create a compromise that would benefit "a wide cross-section" of those affected by interference at 800 MHz, while minimizing the need for a wholesale relocation in the band, according to Laura Smith, president of the Industrial Telecommunications Association.

The coalition includes several non-profit trade organizations such as the Association of American Railroads, Forest Industry Telecommunications, ITA, MRFAC, National Association of Manufacturers, Personal Communications Industry Association and Small Business in Telecommunications.

Smith gave a broad overview of the proposal as it currently stands:

□ There would be two blocks of contiguous spectrum with one block for non-cellularized systems (806-816 MHz/851-861 MHz) and one block for cellularized systems (816-824 MHz/861-869 MHz).

□ The non-cellularized block will consist of public safety, B/ILT and traditional SMR systems.

□ Nextel will relocate to the cellularized block.

□ Nextel's vacated B/ILT and SMR licenses will be used to relocate the NPSPAC licensees into the lower band. Some B/ILT and SMR licensees in the general category pool will need to retune to vacated Nextel spectrum in the interleaved channels to clear enough spectrum to move in the NPSPAC licensees.

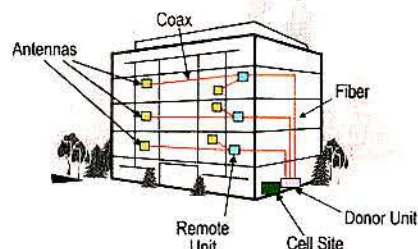
□ The LMCC and the public

safety regional planning committees will work together to develop a comprehensive band plan for the newly created public safety/B/ILT/SMR pool.

□ Nextel pledges \$500 million for funding the relocation costs of the public safety community.

□ Nextel returns its 700 MHz and 900 MHz spectrum to the FCC (and contributes about 2.5 MHz of the spectrum at 800 MHz to the newly created public safety/B/ILT pool) and receives in exchange 10 MHz of spectrum at 1,910-1,915 MHz/1,990-1,995 MHz. Nextel's 700 MHz spectrum would be designated for public safety use and the 900 MHz spectrum for B/ILT use.

If the compromise can be finalized, it will be submitted to the FCC by Aug. 7.



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E. F. Johnson jettisons Hattey, promotes Blaine in restructuring

David L. Hattey, president of the E. F. Johnson Company, Waseca, Minn., was let go on July 8 in a company restructuring that saw several others promoted. Meanwhile, Michael Jalbert, chairman of Johnson's parent company, EFJ, has assumed responsibility as president at Johnson.

"This represents a change in the phase that E. F. Johnson is in," Hattey said. "We had a difference in philosophy in how we could be moving forward. Michael and I decided the best outcome was for me to pursue other interests and for him to reshuffle things a bit."

Hattey said that although his plans are uncertain, "I've been in land mobile radio my whole life, and I would expect that involvement to continue."

Hattey joined Johnson as senior vice president in March 2000 and moved up to president in June 2001. Previously, he was vice president of technical operations at Racom, Marshalltown, Iowa, the operator of a regional EDACS network. Prior to joining Racom, Hattey was a vice president at Ericsson-GE, the company that made EDACS equipment at the time. EDACS now is a product of M/A-Com Wireless.

In the restructuring, Dennis Blaine, vice president of EFJ's Transcript International division, was promoted to executive vice president of sales and marketing for Johnson. Michael Kelley, director of sales and marketing at Transcript International, was promoted to general manager. Massoud Safavi, EFJ's chief financial officer, was given overall responsibility for Transcript International.

To increase Johnson's focus on homeland security, James Ridgell has been appointed Johnson's vice president of business development for federal sales.

Nancy Morrison EFJ's vice president of human resources, was promoted to vice president of administration.

"These appointments place each business unit in a strong position to capitalize on the strengths of these individuals to continue to move the organization forward in achieving strategic initiatives,"

said Jalbert.

Jalbert said that Johnson would continue its focus on federal customers, on homeland security and on Project 25 products for federal, state and local government users.

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CIRCLE (30) ON FAST FACT CARD

News Packets

● An NTIA assessment and legislative proposal released July 22 offer 90 MHz of radio spectrum for 3G cellular, with FCC auction money to be set aside to fund the relocation of federal users — instead of go-

ing to the U.S. Treasury where it would be subject to congressional appropriation.

● Chief Stan Clouser of Alpha Fire Company in State College, Penn., told a reporter for *centredaily.com* that interference from cellular towers operated by Nextel Partners "is gradually getting worse," and Dan Tancibok, director of public safety for the county said,

"It's just so doggone complicated."

● Director Jeff Dillon of Monroe County, W.Va.'s 9-1-1 center took criticism from all sides, including police, fire and paramedic departments and the center's advisory committee in a *Register Herald* (Beckley, W.Va.) news story that reported dissatisfaction with the center's financial management, dispatcher training and radio system, though the county commission's president, Craig Mohler, said: "I think Jeff has done a great job."

● The *Evening News* in Norwich, Norfolk, United Kingdom, reported that provincial police would introduce new TETRA handsets despite reports that as many as 200 police officers elsewhere in the country have claimed health problems stemming from radiation from the handsets.

● The Western Australian Police Services, Perth, will abandon its under-construction digital radio system and continue to use its analog system in the face of what a *West Australian* news story described as "insurmountable problems trying to make the network communicate with other high-tech components built as part of the police service communications overhaul." The Printrak Division of Motorola has a separate \$22 million contract with WAPS for CAD construction and maintenance.

● The Oakland County (Mich.) Law Enforcement Consortium has signed a \$32 million contract with M/A-Com Wireless Systems for an OpenSky digital radio system to serve 80 law enforcement agencies in the county and southeast Michigan.

● The American Radio Relay League, Newington, Conn., will receive a federal homeland security grant of \$181,900 to train amateur radio operators in emergency communications. The grant is to come from a \$10.3 million fund designated to boost homeland defense volunteer programs.

● The FCC has adopted a *Fifth Report and Order* that sets forth a uniform migration path for General Use and State License public safety channels that will promote the deployment of spectrally efficient equipment in the 764-776 MHz and 794-806 MHz band (700 MHz band).

● Firefighters in Independence, Mo., had to be stationed at strategic points to relay messages from an underground warehouse and office space when a commercial press machine in the Space Center Distribution complex caught fire, and the fire department's radio system could not penetrate the structure, according to a news story in the *Independence Examiner*.

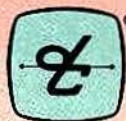
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T-4

CIRCLE (29) ON FAST FACT CARD

Dick DeMello, public safety communications advocate, dies

Richard "Dick" DeMello, 59, died June 25 at his home in Portland, Mich. The cause of death was cancer. DeMello is survived by his wife, Julia; four children; and eight grandchildren.

"I don't know of anyone who was more dedicated to the cause of public safety communications than Dick," said Harlin R. McEwen, chairman of the International Association of Chiefs of Police Communications and Technology Committee.

Patricia Coates, second vice president, Michigan Chapter of Association of Public-Safety Communications Officials, said that, although many public safety responders probably did not know of him, "Dick's efforts to ensure effective communications on their behalf made their jobs safer and made safer all the citizens of Michigan that they serve."

A registered professional engineer, DeMello was born in Massachusetts and moved to Michigan in 1968. He worked for the state government for 32 years, retiring in April 2000 from the Telecommunications Division of the Department of Natural Resources.

He was a director-at-large for the Forestry-Conservation Communications Association.



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GPS antenna offers roof-mount option

Antenna Specialists' Tele-Locator line of dual-system GPS antennas now includes a 3 dBd-gain rooftop mounting option, model series ASP-1860TGPS. This series combines active GPS location identification with broadband trunking or cellular capability for complete frequency coverage without tuning. The antennas feature a $\frac{5}{8}$ -wavelength upper whip over a quarterwave lower section delivering 3 dBd (5 dBi) omnidirectional gain for trunking or cellular applications. The antenna may be installed using an existing $\frac{3}{4}$ -inch hole. A weather-proof ultrasonic seal and O-ring at the mount interface protect against extreme weather conditions.

WWW.ANTENNASPECIALISTS.COM



The antenna features an active GPS module, with an LNA gain of 26 dB

GPS antenna supports asset tracking

The GPS Combi-Whip from **Radiall/Larsen Antenna Technologies** is for asset tracking and AVL applications. Its compact mounts directly to the vehicle with a threaded stud and double-side tape. The

and a GPS antenna gain of 5 dBi. The option with an enclosed coil whip offers a 5-dBi gain, for coverage from 806 MHz-960 MHz. The second option uses a quarterwave whip and covers VHF in 136 MHz-174 MHz and 218 MHz-225 MHz, UHF from 406 MHz-512 MHz, SMR, AMPS and GSM bands. The housing of the antenna is made from UV-resistant ABS resin plastic.

WWW.RADIALLLARSEN.COM

Tri-band antenna mounts on roof

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provides resistance to wind noise. The antenna is mounted to the vehicle's roof using a locknut/gasket sealing system that provides protection from adverse weather conditions.

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Antenna operates on VHF, UHF, GPS

Mobile Mark's dual-band, surface-mount antenna operates on VHF, UHF and GPS frequency bands. The dual-band configurations combine the VHF/UHF antenna with the GPS satellite antenna into one package. The antennas can be mounted to a vehicle's metal surface or any bulkhead

through a $\frac{3}{4}$ " hole. The antennas provide independent dual-band operation. They are enclosed in a weatherproof polycarbonate radome. Everything needed for installation is included.

WWW.MOBILEMARK.COM



Magnetic antenna covers dual bands

Sti-Co Industries' magnetic-mount, dual-band antenna operates on VHF and UHF channels and can be moved from one vehicle to another without damage to the car or antenna. The VHF frequency of MGNT-DB-VHF/UHF is 150 MHz-174 MHz, and the UHF range is 405 MHz-420 MHz. The 16-inch, closed-coil antenna has a black finish with a power rating of 150 W. Seventeen feet of feed line is supplied, as well as a choice of connectors. Other cellular mount disguised antennas are available in glass-mount, trunk lip and roof-mount models in a variety of frequency ranges.

WWW.STI-CO.COM



Magnetic mount system offers flexibility

Antenna Factor's magnetic-mount antenna system allows users to select 40-, 66- or 85-millimeter bases that contain a magnet for semi-permanent installation. The base's protective layer protects finished surfaces. It has in-



terchangeable elements covering frequencies from 824 MHz to 2.4 GHz with gains to 9 dBi. The base is supplied with a 10.5-foot coax terminated in TNC, mini-UHF, SMA or RP-SMA connectors.

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Antenna analyzer covers 600 to 999

AEA Wireless' CellMate EX antenna analyzer has been developed to cover the 600 MHz medical telemetry spectrum, the 700 MHz auction spectrum and cellular frequencies. The analyzer provides a graphical representation of VSWR and return

loss and features EL backlighting, 15 non-volatile plot memories and a signal generator mode. It also works with the company's Analyst Director Software for high-resolution plotting and archiving.

WWW.AEA-WIRELESS.COM

Multiband radio offers satcom IP

Harris now has an embedded, fully secure, satellite communications Internet protocol capability for its Falcon II AN/PRC-117F multiband multimission radio. The capability can be used in conjunction with either 25 kHz or 5 kHz UHF tactical satcom channels and provides transparent IP application support with full U.S. Department of Defense Type 1 security. The radio can optimize IP throughput per-

formance over UHF tactical satcom channels by automatically adapting to dynamic channel conditions. The capability can eliminate the dependency on external interface boxes used to link to an IP network. The radio supports a standard, point-to-point protocol interface through the front panel of the radio, which can be cabled directly to a PC, router or other network device.

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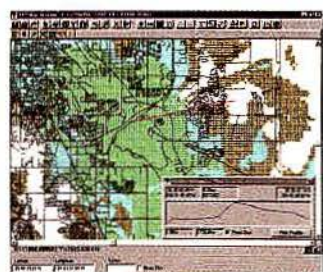
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Terrain software offers 24 modules



SoftWright has released version 4.4 of the Terrain Analysis Package for Windows 9x/NT/W2K. This software consists of 24 modules that, when combined, bring a broad capacity of RF system design to the PC. This software is used to perform evaluations of existing or proposed radio transmitter sites, to predict radio coverage for TV and FM broadcasting, and to design cellular, paging, and two-way radio systems. The fundamental module is the basic mapping module, which handles the path terrain profiling work. The RF facilities module can also be added.

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UHF radio receives type acceptance

The RPU416A from **Relm Wireless** has received FCC type acceptance. It is a 16-channel portable. The lightweight radio comes with a rapid rate desktop charger and an 1,100 mAh, NiMH battery. Built-in features include priority channel scanning, CTCSS, DCS and two-tone decode and encode. The Mil-Spec RP series can be programmed using Windows-based software or can be cloned from a similar RP radio.

WWW.RELM.COM

System works in emergencies

WorldCell and **IDL** have launched an emergency communications system, the satellite-based backup emergency communications network (BECoN). Leveraging the Iridium satellite network, the system can be deployed in cases of total infrastructure failure because it does not rely on ground infrastructure to complete a call. The system can be permanently installed or rapidly deployed in the field during a crisis. It enables communications between command centers, field teams and landline or mobile phones outside the affected region. The system consists of the base pack and the field pack.

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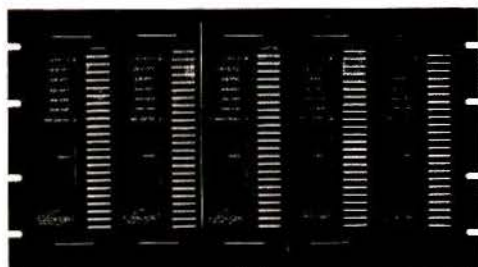
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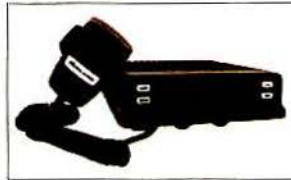


The KGP-2A/2B GPS receiver and modem from **Kenwood Communications** are ready for use with the 80 series or 60G series trunking mobiles. Designed to make AVL readily available through affordable access to GPS technology, the receiver is installed in a vehicle, incorporating a built-in modem with microprocessor control for base station and mobile unit coordination. One receiver is used for each base station. The radio connection, for two-way communications, is provided through conventional and trunking mobiles.

WWW.KENWOOD.NET

Vehicle repeater teams portables, mobiles

Midland Radio's Titan vehicle repeater mounts into the chassis of a Titan mobile radio and integrates without external cables or add-



ons, which allows portable users to communicate into their system. Using the repeater function, a portable transmission is received at 2 W and is then retransmitted by the mobile at that unit's power level that could be as high as 110 W.

So a portable user could potentially communicate with another person on the system from more than 40 miles away. The repeater retransmits incoming messages at 1 W, allowing a portable user to stay in communications with the base station from more than 1 mile away from the vehicle, depending on the conditions.

WWW.MIDLANDRADIO.COM

Encryption plugs into Motorola radios

Midian offers plug-in encryption for Motorola's entry-level radios, the CT-25/450, Pro-3150 and the P040/080. The MOT-TVS-2-PRO-EL is a high-level rolling code scrambler, and the MOT-VPU-15-

PRO-EL is a voice inversion scrambler. Midian's TVS scramblers use a frequency hopping type of rolling code instead of frequency sweeping for higher security.

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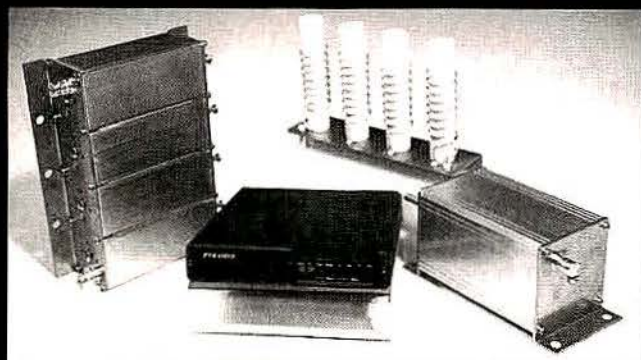
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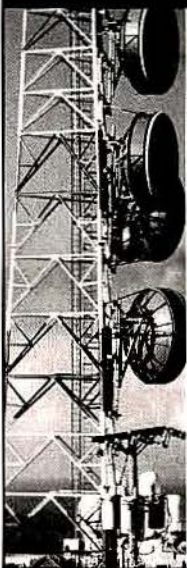
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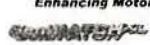
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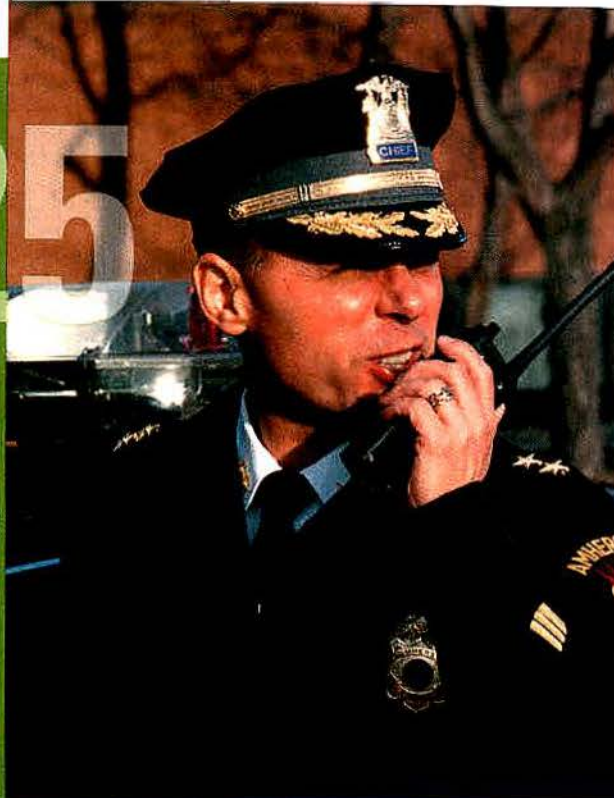


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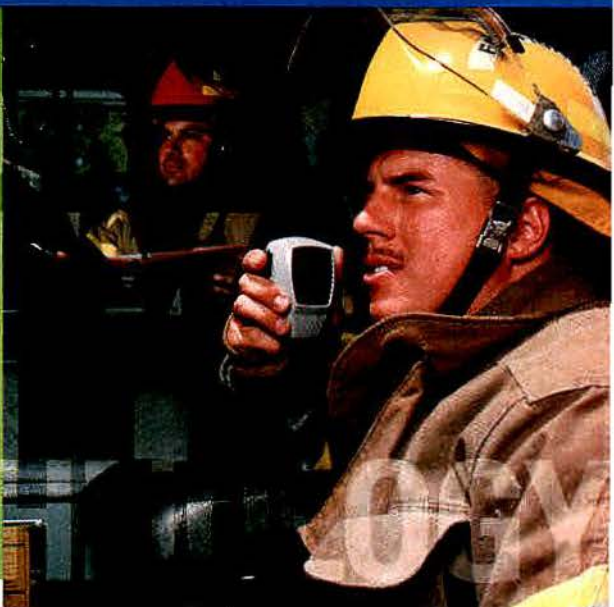
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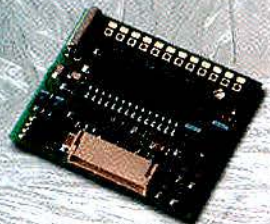




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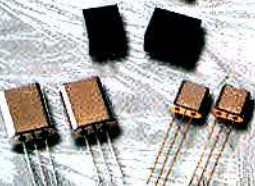
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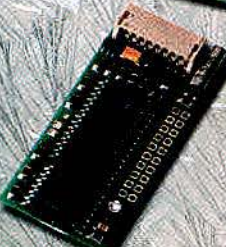
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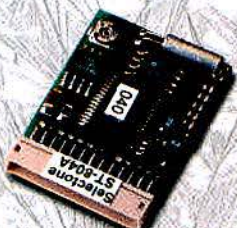
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